ONWA KA-120

MODEL

SERVICE MANUAL

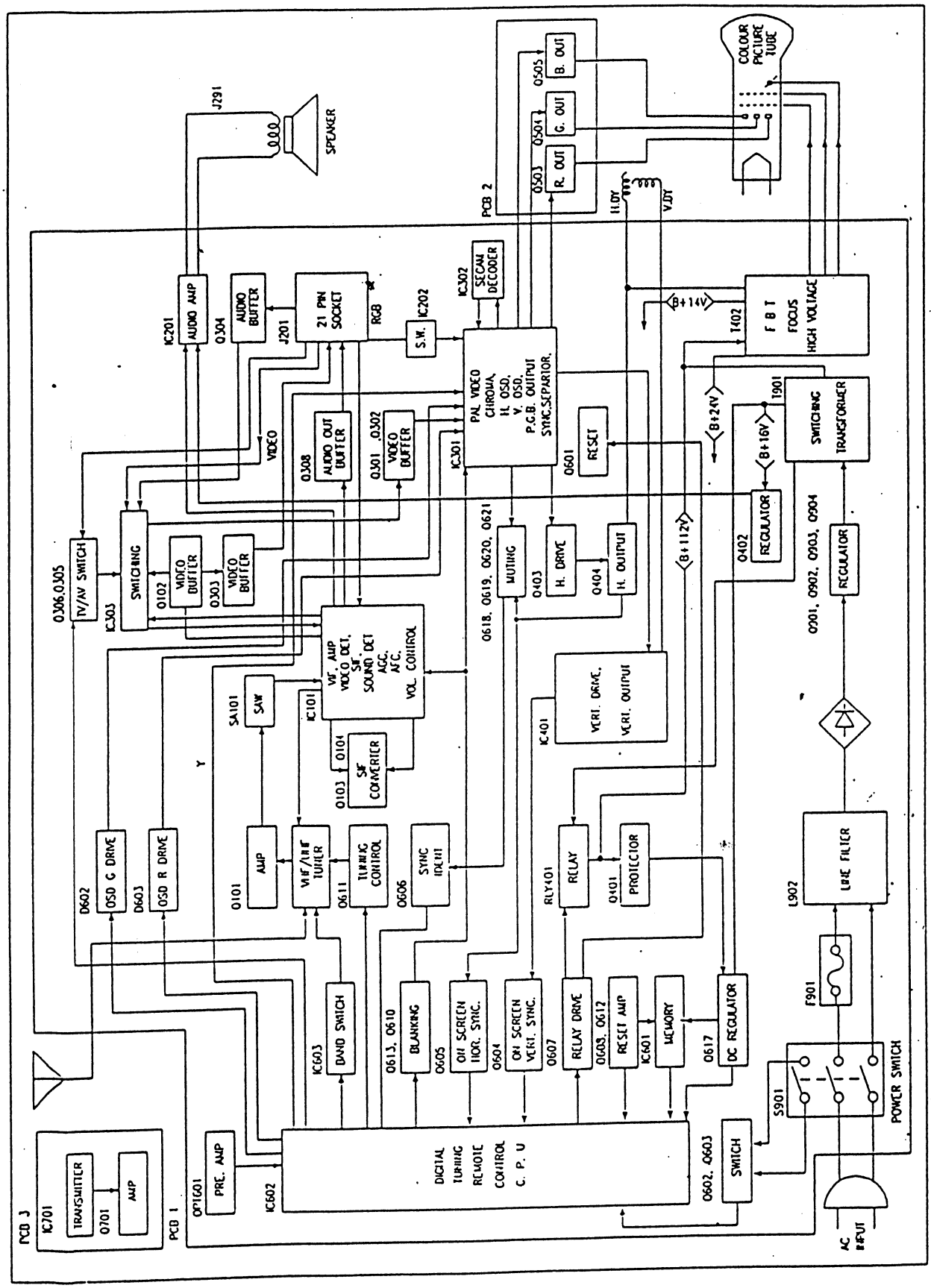
CONTENTS

	PAGE
BLOCK DIAGRAM	2
CONTROL LOCATION	3
ALIGNMENT INSTRUCTION	4
TRANSISTOR AND IC IDENTIFY	11
PICTORIAL VIEW OF TUNER	11
WIRING DIAGRAM	12
EXPLODED VIEW DIAGRAM	13
PARTS LIST	14
REMOTE HANDSET MANUAL	15
SPECIFICATION	17
COMPONENT DIAGRAM	18
SCHEMATIC DIAGRAM	21

This manual is the latest at the time of printing, and does not include the modification which may be made after the printing, by the constant improvement of product.

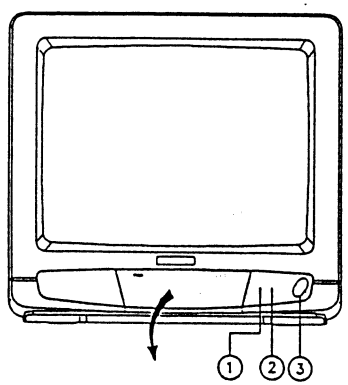
M9115-19/20

BLOCK DIAGRAM

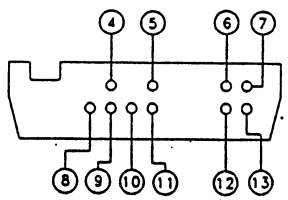


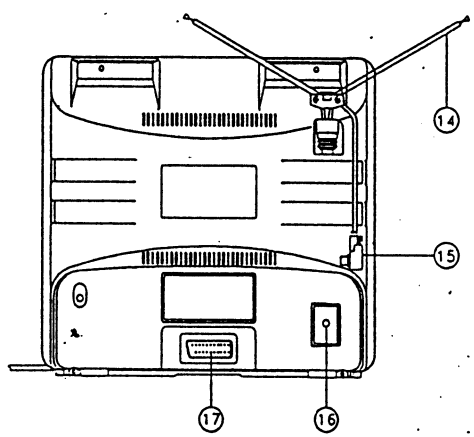
CONTROL LOCATION

1. Remote Sensor
2. Power Indicator
3. Power Switch (ON/OFF)
4. Auto Tune Button
5. Picture Selector Button
6. Volume/Picture Function Button (+)
7. Programme Up Button
8. TV/AV Button
9. Tuning Down Button
10. Tuning Up Button
11. Memory Button
12. Volume/Picture Function Button (-)
13. Programme Down Button
14. Rod Antenna
15. Antenna Adaptor (300 Ohm-75 Ohm)
16. Antenna Input (Tuner)
17. 21 Pin Scart Socket



PUSH TO OPEN THE PANEL





ALIGNMENT INSTRUCTION

I. PLEASE READ BEFORE ATTEMPTING SERVICE

1. Do not connect any antenna plug directly to the tuner socket and do not connect any equipment directly to the TV chassis, otherwise it may be burnt out the TV or equipment, except an isolation transformer is used for main power source of the TV sets.
2. Never disconnect any leads while receiver is in operation.
3. Disconnect all power before attempting any repairs.
4. Do not short any portion of the circuit while power is on.
5. For reason of safety, all parts replaced should be identical, (for parts and part number see parts list).
6. Before alignment the set must be pre-heated for 30 minutes or more and erase magnetism thoroughly from CRT front chassis frame by erase coil.

II. TEST EQUIPMENT

1. VIF Sweep Generator
2. SIF Sweep Generator
3. Colour Bar/Dot/Cross Hatch Generator
4. DC Power Supply (12V and 14V)
5. Oscilloscope
6. Vacuum Tube Voltmeter
7. Volt Ohm Meter
8. High Voltage Meter
9. Ampere Meter (0.5 Class, DC 3mA Max.)
10. Demagentizing Coil
11. Philips Pattern Generator
12. Frequency Counter
13. Continuous Waveform Generator
14. 21 Pin Connector

III. TANK COIL ALIGNMENT

A. PREPARATION STEP (SEE FIG.2)

1. Connect OUTPUT lead of VIF Sweep Generator to TUNER TEST POINT TP and TUNER CASE.
2. Connect lead of FROM DET between TP106 and GND.
3. Supply DC +14V to ⊕ lead of D408.
4. Supply RF AGC bias voltage to TP104. (See Fig.1)
5. Disconnect soldering pad of Tuner BL.

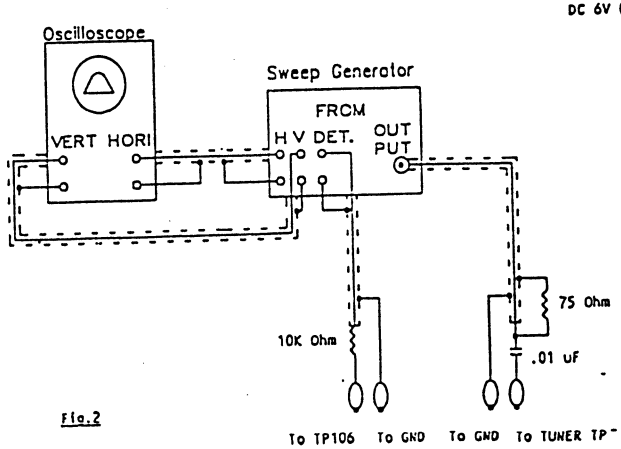


Fig.2

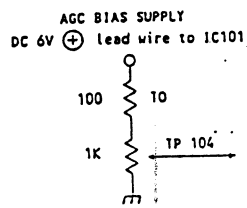
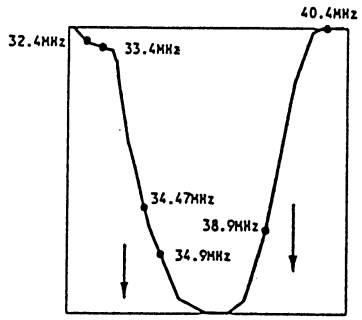


Fig.1

B. ALIGNMENT STEP (SEE FIG.3)

1. Adjust AGC bias voltage to 6V.
2. Increase the output level of Sweep Generator -8dB below saturation.
3. Adjust T105 to obtain maximum amplitude at 38.9MHz.
4. Adjust tuner converter coil for maximum amplitude at 38.9MHz and 34.9MHz.
5. *Make sure the output waveform. (See Fig.3)*
6. Adjust AFC alignment as below.

Fig.3

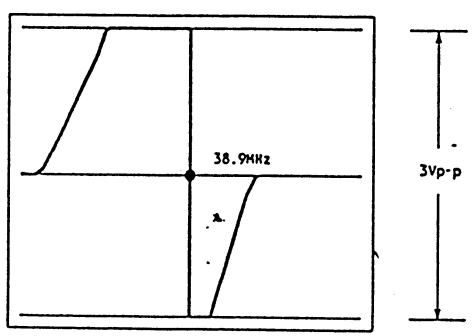


IV. AFC ALIGNMENT

A. PREPARATION STEP

1. Connect RF AGC bias voltage at TP104.
2. Connect output lead of Continuous Waveform Generator to TUNER TEST POINT TP and TUNER CASE.
3. Connect lead of FROM DET between TP107 and GND.
4. Supply DC +14V to ⊕ lead of D408 and AGC BIAS voltage to 6V.
5. Adjust OUTPUT level of Sweep Generator same as TANK COIL ALIGNMENT.
6. Adjust T106 to obtain the waveform as shown in Fig.4.
7. After alignment, join the soldering pad of Tuner BL.

Fig.4

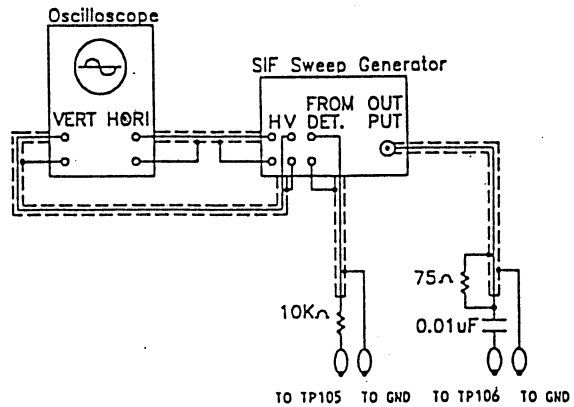


V. PAL SIF ALIGNMENT

A. PREPARATION STEP (SEE FIG.5)

1. Connect output lead of SIF Sweep Generator between TP106 and GND.
2. Connect lead of FROM DET between TP105 and GND.
3. Supply DC +14V to ⊕ lead of D408.
4. Connect TP104 to GND.

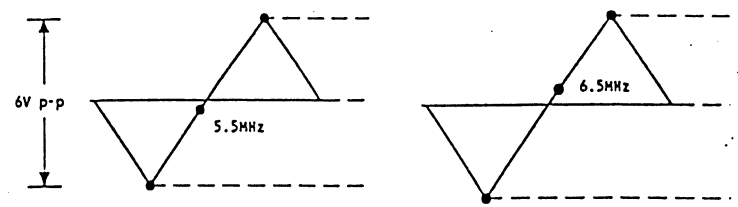
Fig.5



B. ALIGNMENT STEP

1. Adjust output of Sweep Generator to achieve 6Vp-p between markers of 100KHz.
2. Adjust T104 so that sound carrier is centered as in Fig.6.

Fig.6.



VI B+ ADJUSTMENT

1. Connect the digital voltmeter to TP401.
2. Adjust semi-fixed resistor VR901 until meter reading DC 112.25V ± 0.25V.

VII HORIZONTAL CIRCUIT ADJUSTMENT

1. Set to AV mode.
2. Using Frequency Counter to measure frequency at collector of Q403.
3. Adjust semi-fixed resistor VR302 to obtain Horizontal frequency 15520Hz ± 20Hz.
4. Set to TV mode and receiver Philips Pattern.
5. Adjust VR301 Horiz. Centre to obtain the picture at center.

VIII. COLOUR DEMODULATOR ALIGNMENT, DELAY LINE ALIGNMENT

1. Receive Philips Pattern.
2. Set Contrast control to minimum position.
3. Set Colour control to maximum position.
4. Connect Oscilloscope to TP304 (B-out).
5. Adjust CT301 to obtain the waveform as in Fig.7.
6. Adjust VR306 to obtain the waveform as in Fig.7.
7. Adjust T303 to obtain the waveform as in Fig.7.

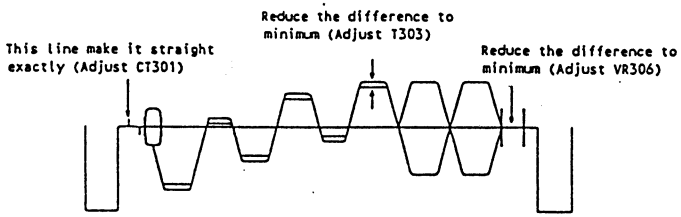

Reduce the difference to minimum (Adjust T303)
This line make it straight exactly (Adjust CT301)
Reduce the difference to minimum (Adjust VR306)

Fig.7

IX. CHOKE FILTER ALIGNMENT (SEE FIG.8)

1. Connect Oscilloscope to TP301 through the resistor 5.6K.
2. Receive colour bar signal.
3. Adjust T302 to obtain the waveform as same as Fig.8.

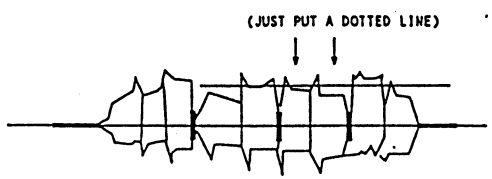


Fig.8

X. SECAM CHROMA ADJUST (SEE FIG.9)

1. Connect Oscilloscope to TP306 and GND.
2. Receive SECAM dot signal.
3. Set VR305 to middle position.
4. Adjust T301 to obtain the waveform as in Fig.9.

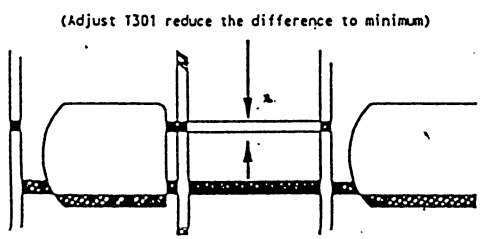


Fig.9

6. Fine tune VR305 to obtain the waveform as in Fig.10.

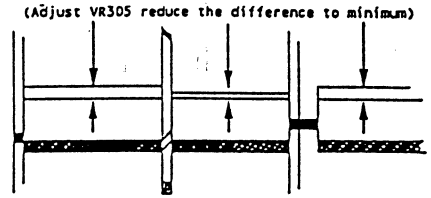


Fig.10

7. Fine tune T301 make the background of picture in white or little red colour.
8. Fine tune T302 to reduce dot colour spreading if it appears.

XI. VERTICAL CIRCUIT ADJUSTMENT

1. Receive the Monoscope Pattern.
2. Set to AV mode
3. Connect the Frequency Counter between V-DEFLECTION YOKE and GROUND.
4. Adjust SUB-V-HOLD (VR303) to the reading 44 Hz ± 1Hz.
5. Receive Monoscope Pattern.
6. Adjust V-SIZE (VR401) control to obtain a normal picture.

XII. WHITE BALANCE ADJUSTMENT

1. Receive a blank signal.
2. Turn the green, blue and red LOW LIGHT (VR501, VR502, VR504) controls to middle position and turn the DRIVE (VR503, VR505) controls to middle position.
3. Set the Sub-Brightness (VR304) control to middle position, then set the Contrast, Brightness and Colour control to minimum position.
4. Turn the Screen control on the FBT to minimum position.
5. Short CN403
6. Slowly turn the Screen control to the point where a horizontal line just illuminates.
7. Adjust VR501 to get a red horizontal line on CRT.
8. Adjust VR502 to get a yellow horizontal line on CRT.
9. Adjust VR504 to get a white horizontal line on CRT.
10. Take the jumper out of CN403.
11. Receive a black and white picture signal.
12. Adjust Drive (VR503, VR505) controls to obtain a uniform white picture.

XIII. FOCUS ADJUSTMENT

1. Set Contrast control to maximum position and Brightness control to middle position.
2. Adjust Focus control (on the FBT) to obtain a sharpest and clearest picture on the CRT.

XIV. RF AGC ALIGNMENT

1. Receive the signal of BAND-III (VHF HIGH) channel.
2. Set the input field strength in 62 ± 1dB.
3. Adjust RF AGC (VR101) control to the point where noise is disappeared.

XV. SUB-BRIGHTNESS ALIGNMENT

1. Receive Monoscope Pattern.
2. Set Controls as follow :

BRIGHTNESS	control	.....	MID. position
CONTRAST	control	.....	MID. position
COLOUR	control	.....	MIN. position

3. Adjust SUB-BRIGHTNESS (VR304) to get ten step of the grey scale just illuminate in Monoscope Pattern.

XVI. COLOUR PURITY ADJUSTMENT (SEE FIG.11)

BEFORE ALL ADJUSTMENT DESCRIBED BELOW ARE ATTEMPTED, V-HOLD, H-HOLD, V-HIGH, B+ VOLTAGE AND FOCUSING ADJUSTMENT MUST BE COMPLETED.

1. Place the TV receiver facing NORTH or SOUTH.
2. Plug in TV receiver and turn it on.
3. Operate the TV receiver over 30 minutes.
4. Fully degauss the TV receiver by using an external degaussing coil.
5. Receive a crosshatch pattern and adjust the static convergence control roughly.
6. Loosen the clamp screw of the deflection yoke and pull the deflection yoke towards you.
7. Fully turn the red and blue DRIVE (VR503, VR505) controls counter-clockwise.
8. Adjust the purity magnets so that green field is obtained at the center of the screen.
9. Slowly push the deflection yoke towards bell of CRT and set it where a uniform green field is obtained.
10. Tighten the clamp screw of the deflection yoke.

XVII. ON SCREEN ADJUSTMENT

1. Receive the Monoscope Pattern.
2. Adjust on screen (VR602) for adjust the lettering to center of CRT.

XVIII. CONVERGENCE ADJUSTMENT (SEE FIG.11)

1. Receive a dotted pattern.
2. Unfix the convergence magnet clamper and align red with blue with blue dots at the center of the screen by rotating (R,B) static convergence magnets.
3. Align Red/Blue with green dots at the center of the screen by rotating (RB-G) static convergence magnet.
4. Fix the convergence magnets by turning the clamper.
5. Remove the DY wedges and slightly tilt the deflection yoke horizontally and vertically to obtain the good overall convergence.
6. Fix the deflection yoke by wedges.
7. If purity error is found, follow 'PURITY ADJUSTMENT' instructions.

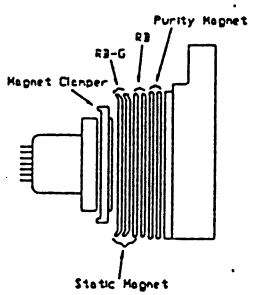


Fig.11

XIX. THE 4 PIN WIRE ASS'Y CONNECT FOR CAI HONG CRT (SEE FIG.10)

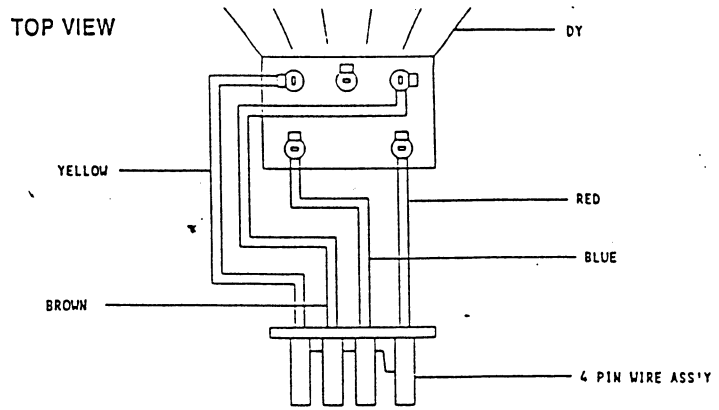
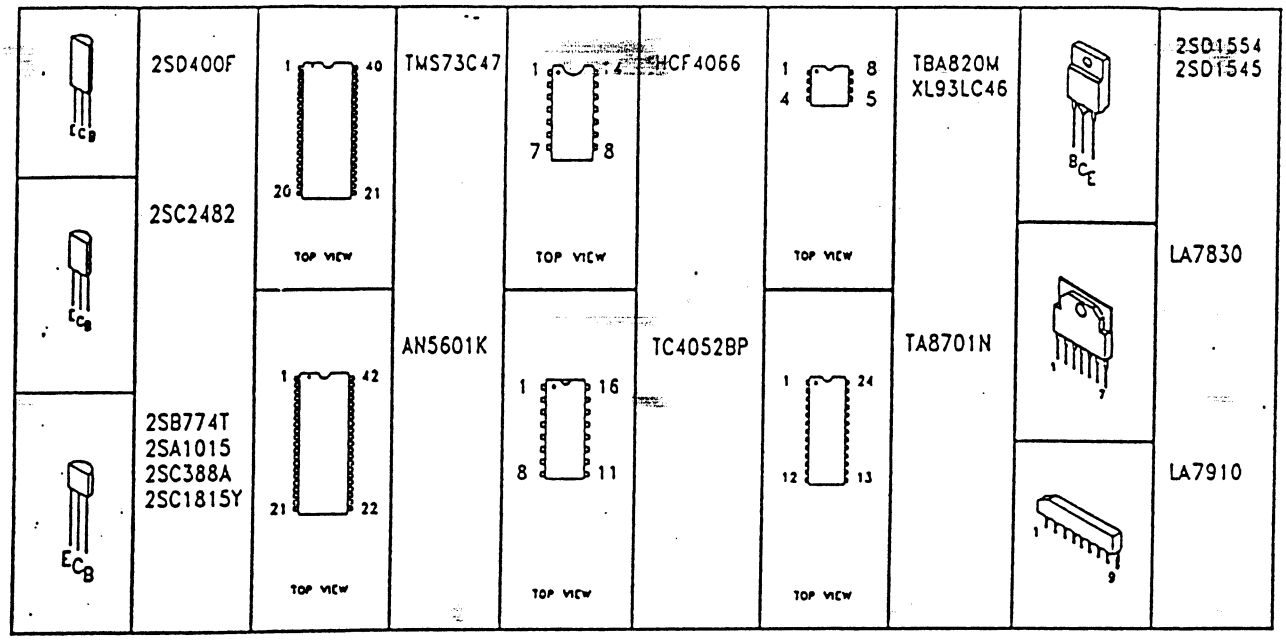


Fig.10

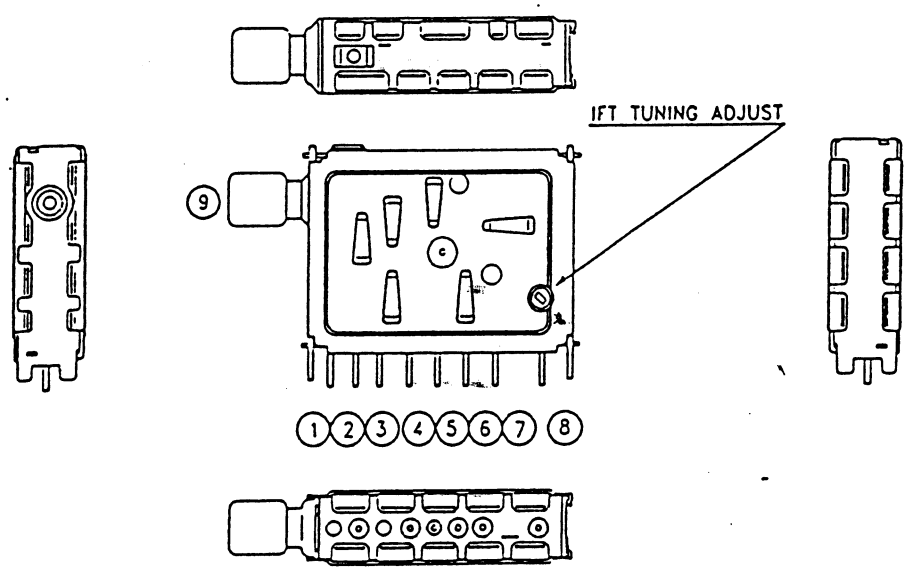
TRANSISTOR AND IC IDENTIFY



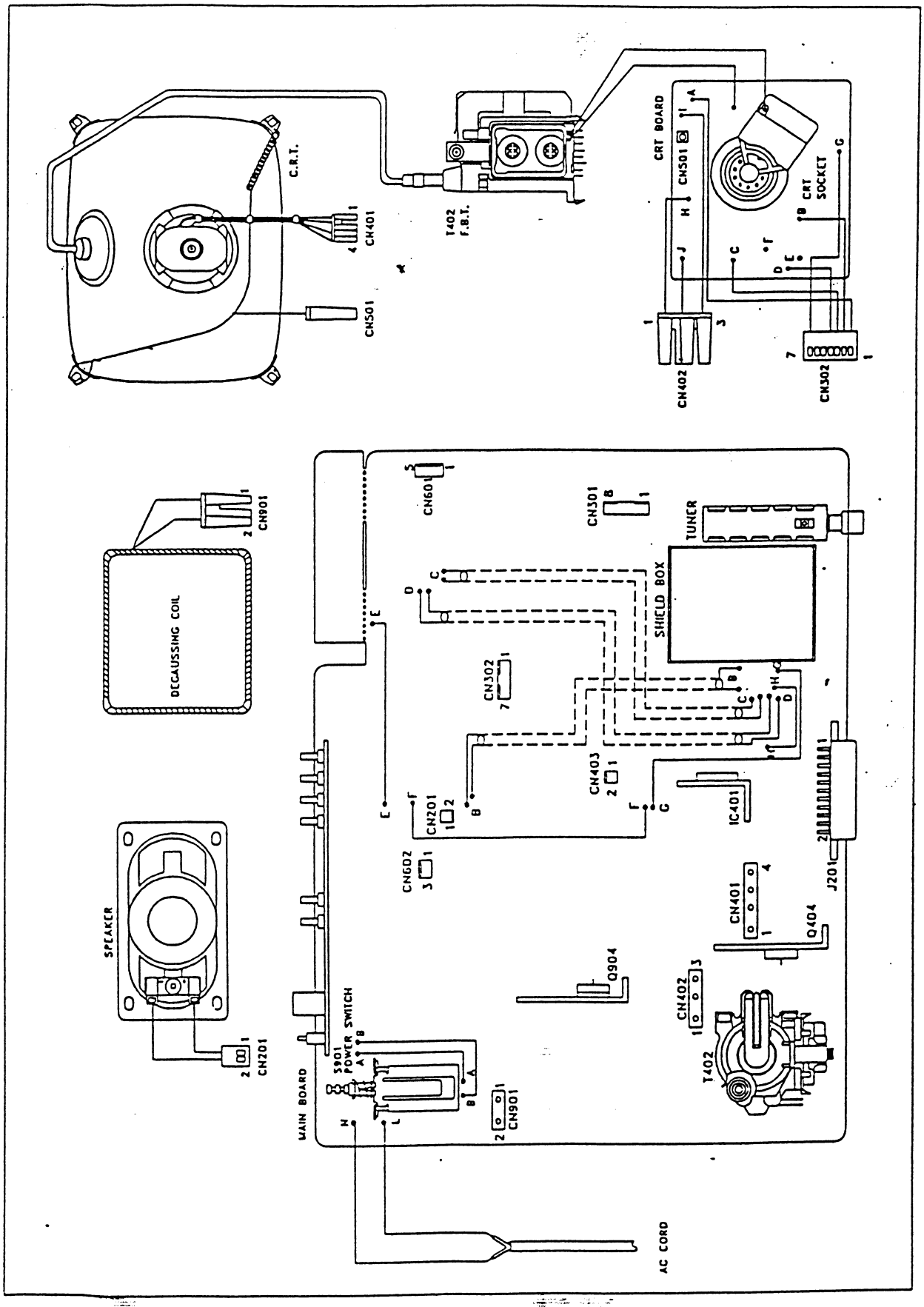
PICTORIAL VIEW OF TUNER

TERMINAL NO.	1	2	3	4	5	6	7	8	9
TERMINAL NAME	BU	VT	BH	AGC	BL	AFT	BM	IF	V/U ANT

SUPPLY VOLTAGE (V)				
TERM.	ch.	VHF LO	VHF HI	UHF
7	BM	12	12	12
5	BL	12	OPEN	12
3	BH	OPEN	12	OPEN
1	BU	OPEN	OPEN	12



WIRING DIAGRAM



NOMENKLATURA CZESCI ZAMIENNYCH DLA TELEWIZOROW ONWA K 9515
dotyczy czesci trudnodostepnych i specjalnych

LP.	KOD CZESCI	NAZWA TECHNICZNA	LOKALIZACJA W TV	
			SCH.IDEOWY	SCH.MECH.
1	ONWELE -CRT	KINESKOP 14" SAMSUNG	CRT	
2	ONWELE T401	TRANSFORM.ODCHYL.POZIOMEGO	T401	
3	ONWELE T104	CEW.POS.CZ.FONII 31M7-M	T104	
4	ONWELE T105	CEW.POS.CZ.WIZJI B199CN	T105	
5	ONWELE Q101	TRANZYSTOR 2SC 388ATM	Q101	
6	ONWELE Q---	TRANZYSTOR 2SC 1815-Y	UNIWERSAL.	
7	ONWELE Q403	TRANZYSTOR 2SC 2482	Q403	
8	ONWELE Q904	TRANZYSTOR 2SD 1545	Q904	
9	ONWELE Q404	TRANZYSTOR 2SD 1554	Q404	
10	ONWELE IC303	UKLAD SCAL. TC 4052 BP	IC303	
11	ONWELE IC201	UKLAD SCAL. KA 2201 N	IC201	
12	ONWELE IC701	UKLAD SCAL. TC 9012F	IC701	
13	ONWELE TACT	PRZELACZNIK KPT-1105 YP	S601-610	
14	ONWELE L101	CEWKA 100uH EL0606SKI-101K	L101	
15	ONWELE L10_	CEWKA 1.5uH EL0606SKI-1R5K	L102,103	
16	ONWELE T402	TRAFOPOWIELACZ FCK-14A019A	T402	
17	ONWMEC DOOR	DRZWICZKI FRONTOWE		POZ.1
18	ONWMEC POWR	PRZYCISK WLACZ.ZASILANIA		POZ.2
19	ONWMEC GRIL	MASKOWNICA GLOSNIKA		POZ.3
20	ONWMEC FMSK	MASKOWNICA PRZEDNIA TV		POZ.4
21	ONWMEC PILO	NADAJNIK (PILOT) ZDALN.STER.		POZ.5

****** KONIEC LISTY *****

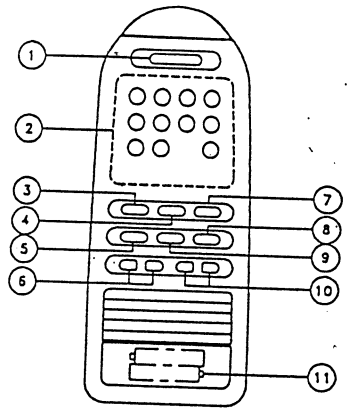
EXPLODED VIEW PARTS LIST:

LOCATION	PARTS NO.	DESCRIPTION	QTY
1	200-931501-XX	FRONT CABINET	1
2	477-682101-01	COMPRESSION SPRING	1
3	292-931501-01	POWER KNOB	1
4	263-931501-01	LENS	1
5	702-391201-02	DOOR LOCKER ASS'Y	1
6	418-931504-01	CONTROL OVERLAY	1
7	219-931501-01	PANEL DOOR	1
8	403-931501-01	SPEAKER GRILLE	1
9	411-371601-XX	NAME PLATE	1
10		SPEAKER	1
11	614-400408-10	SELF-TAPPING SCREW B/T 4 x 8 mm	2
12	334-391501-01	RUBBER RING (T=3mm)	4
13		C.R.T. 14"	1
14		DEGAUSSING COIL ASS'Y	1
15	477-371601-01	C.R.T. SPRING	1
16	259-911501-01	DEGAUSSING COIL CLIP	2
17	229-371501-01	C.R.T. MTG CLIP	4
18	614-500238-10	SELF-TAPPING SCREW B/T 5 x 38 mm	4
19		MAIN P.C. BOARD ASS'Y	1
20	046-100001-14	POWER SWITCH	1
21	239-391201-01	ADAPTOR FOR POWER SWITCH	1
22		FUNCTION P.C. BOARD ASS'Y	1
23	229-911502-01	FUNCTION P.C. BOARD MOUNTING BRACKET	1
24	530-080032-08	FIBRE WASHER	2
25	612-300110-10	SELF-TAPPING SCREW W/T 3 X 10 mm	2
26		C.R.T. P.C. BOARD ASS'Y	1
27	202-931502-XX	BACK CABINET	1
28	418-911540-01	TUNER COVER W/SILK-PRINTING	1
29	412-931501-XX	MODEL PLATE	1
30	614-400416-10	SELF-TAPPING SCREW B/T 4 x 16 mm	2
31	614-400412-10	SELF-TAPPING SCREW B/T 4 x 12 mm	1
32	614-500416-10	SELF-TAPPING SCREW B/T 5 x 16 mm	2
33	779-691001-01	ROD ANTENNA ASS'Y	1
34	062-110011-00	ANTENNA ADAPTOR	1

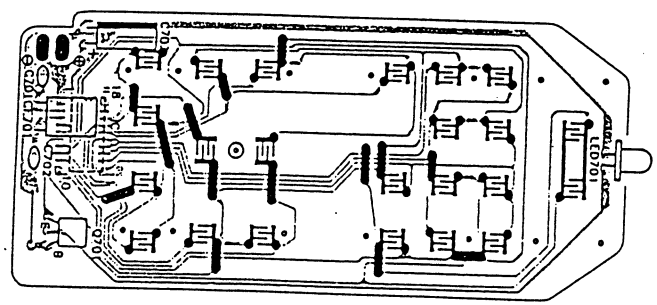
REMOTE HANDSET UNIT

CONTROL LOCATION

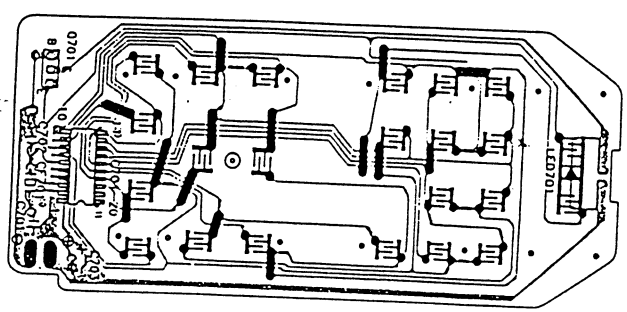
1. Stand By Button
2. Number Buttons
3. Mute Button
4. Sleep Button
5. Picture Selector Button
6. Volume and Picture Function Up/Down Buttons
7. Recall Button
8. TV/AV Button
9. Normal Button
10. Programme Up/Down Buttons
11. Battery Compartment



COMPONENT DIAGRAM OF REMOTE HANDSET P.C. BOARD :

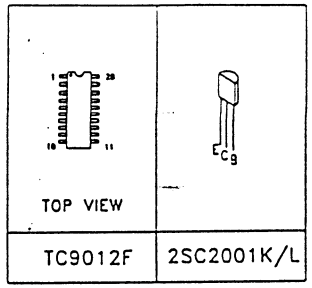


(TOP VIEW)



(BOTTOM VIEW)

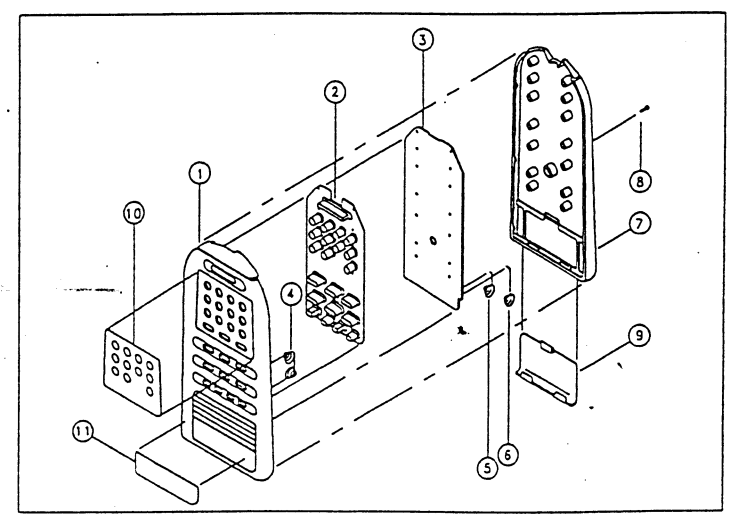
TRANSISTOR & IC IDENTIFY



TC9012F	2SC2001K/L

REMOTE HANDSET UNIT OF EXPLODED VIEW PARTS LIST :

LOCATION	PARTS NO.	DESCRIPTION	QTY
1	201-3905XX-XX	TOP CABINET	1
2	334-390304-01	CONDUCTIVE RUBBER	1
3		HANDSET P.C. BOARD ASS'Y	1
4	477-390203-01	BATTERY CONTACT SPRING WIRE +,- VE	1
5	477-390502-01	BATTERY CONTACT SPRING WIRE - VE	1
6	477-390501-01	BATTERY CONTACT SPRING WIRE + VE	1
7	203-390501-XX	BOTTOM CABINET	1
8	610-260108-00	SELF-TAPPING SCREW R/T 2.6 x 8 mm	1
9	210-390501-XX	BATTERY COVER	1
10	418-390304-11	PRESET OVERLAY	1
11	411-3905XX-XX	NAME PLATE	1

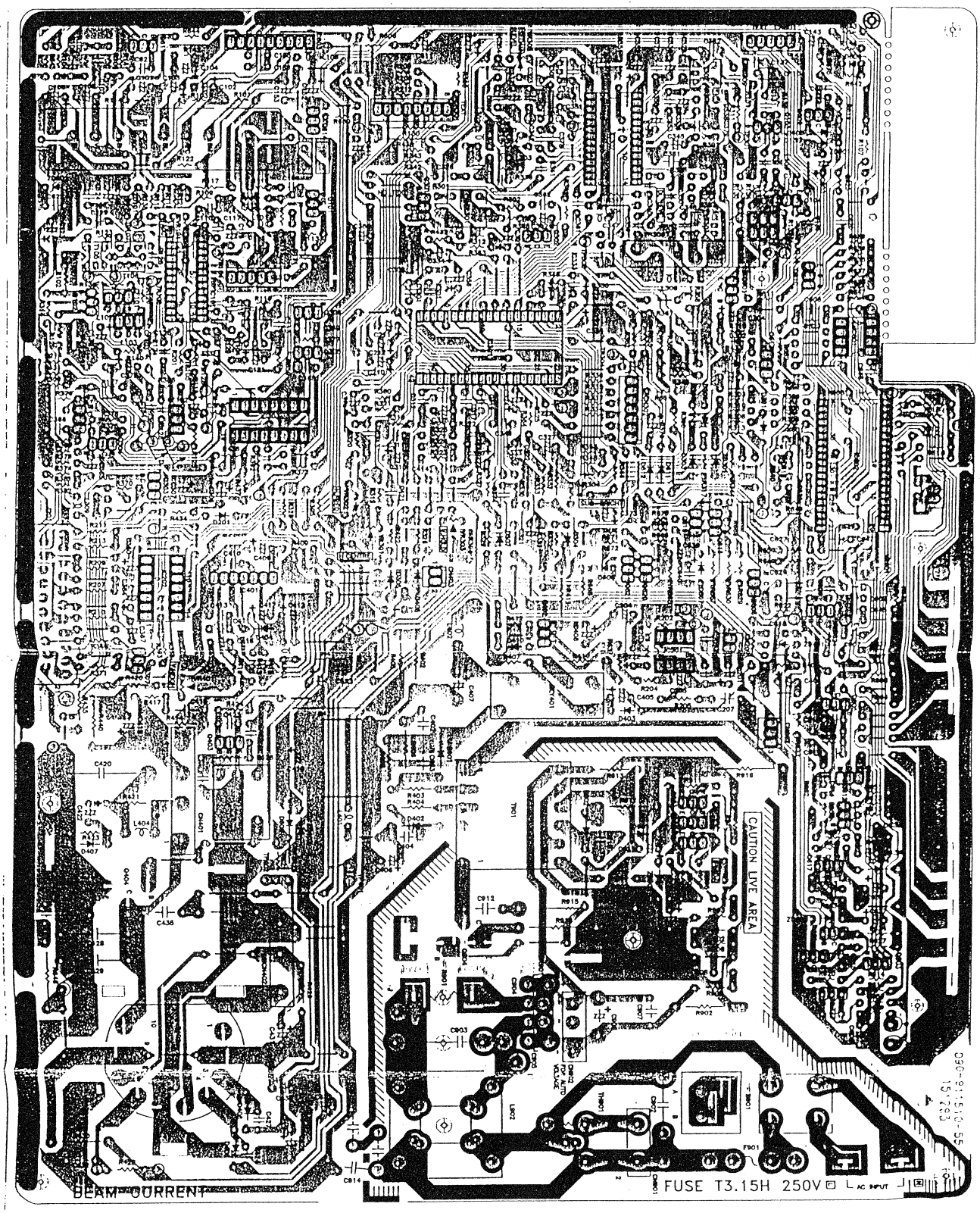


M9115-19/20

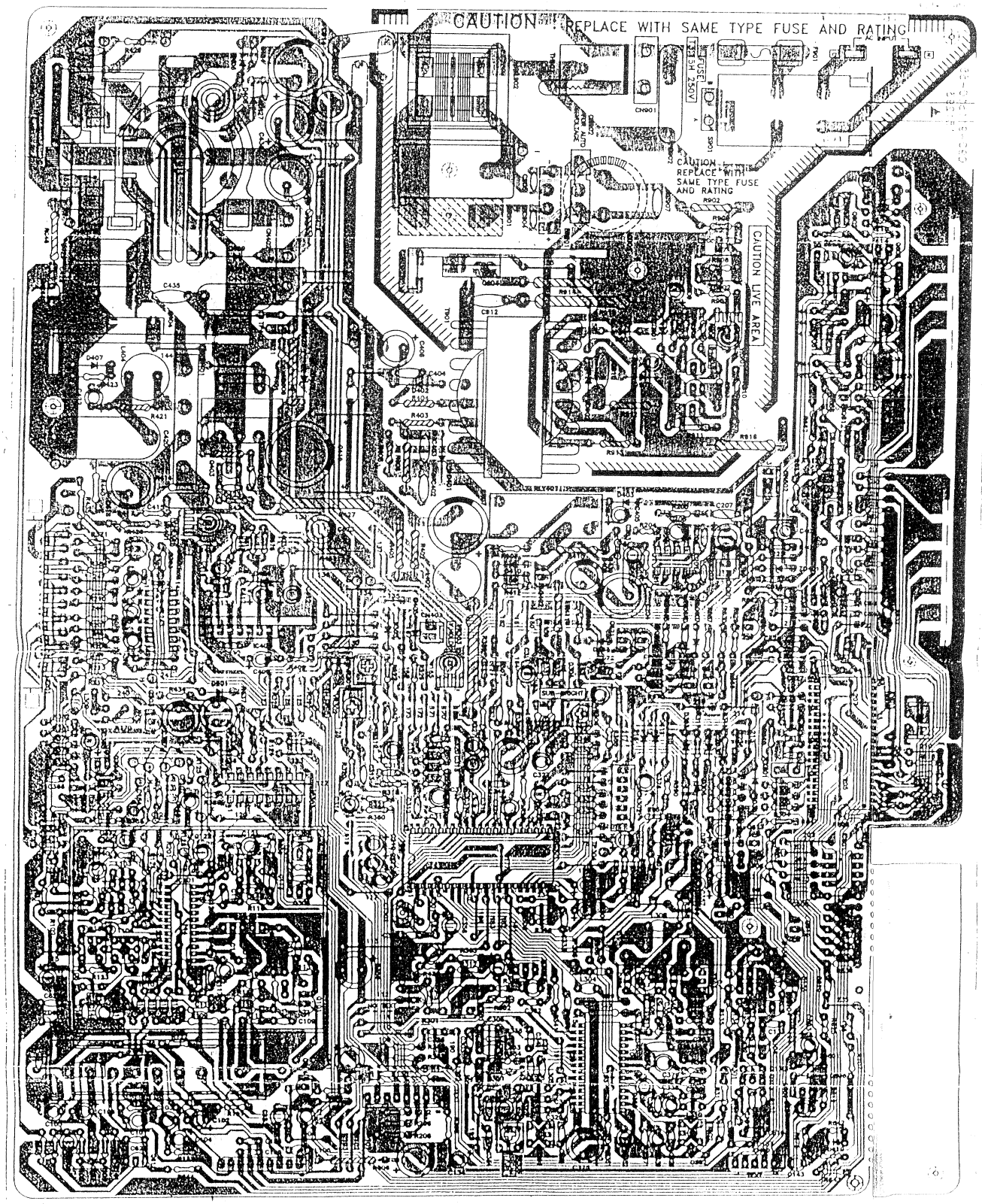
SPECIFICATION

SYSTEM		:	PAL/SECAM BG/DK
DESTINATION		:	W.GERMANY
CHANNEL COVERAGE	VHF LOW	:	E2 - E4, SS1 - SS3, S1 - S2 CH
	VHF HIGH	:	E5 - E12, S3 - S20 CH
	UHF	:	21 - 69 CH
FREQUENCY RANGE	VHF LOW	:	48.25 - 112.25 MHz
	VHF HIGH	:	119.25 - 294.25 MHz
	UHF	:	471.25 - 855.25 MHz
SCANNING	LINES	:	625 LINES
	HORIZONTAL	:	15625 Hz
	VERTICAL	:	50 Hz
IF FREQUENCY	VIDEO	:	38.9 MHz
	SOUND	:	33.4 MHz
	CHROMA	:	34.47 MHz
VISION/SOUND SEPARATION		:	5.5/6.5 MHz
SENSITIVITY	VHF LOW	:	32 µV
	VHF HIGH	:	56 µV
	UHF	:	80 µV
OUTPUT POWER	MAXIMUM	:	1000 mW
	10% THD	:	700 mW
C.R.T.		:	14" (36 cm) Diagonal, 22.5 mm Neck Diameter 90° Deflection Angle
SPEAKER		:	50 mm x 90 mm, 16 Ohm
ANTENNA IMPEDANCE		:	75 Ohm
POWER CONSUMPTION		:	70 Watts
VIDEO INPUT		:	1Vp-p (POSITIVE VIDEO) 75 Ohm IMPEDANCE
AUDIO INPUT		:	0.5V r.m.s. (1 KHz) 47K Ohm IMPEDANCE

COMPONENT DIAGRAM FOR BOTTOM VIEW (MAIN BOARD)



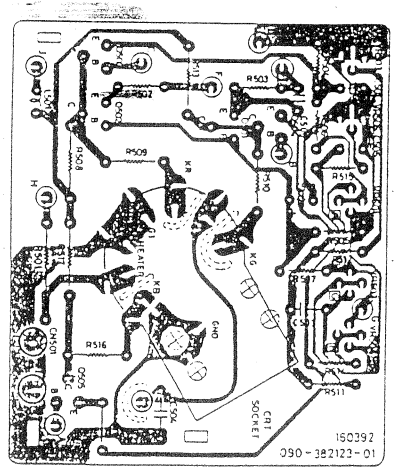
COMPONENT DIAGRAM FOR TOP VIEW (MAIN BOARD)



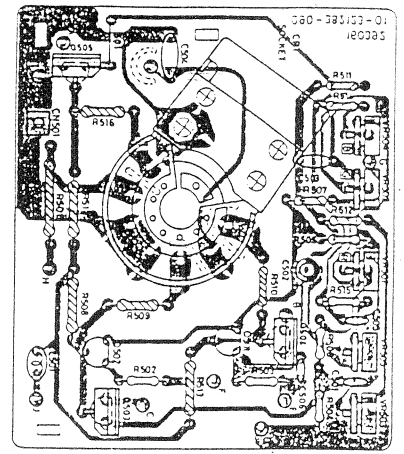
COMPONENT DIAGRAM

CRT BOARD

(BOTTOM VIEW)

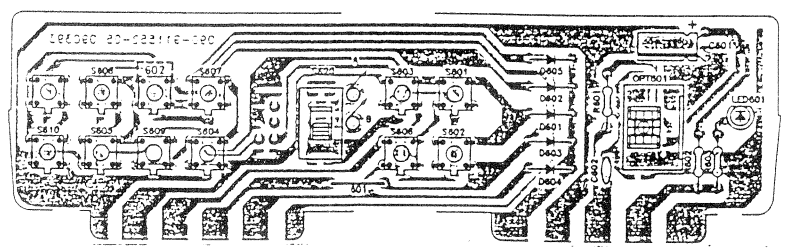


(TOP VIEW)

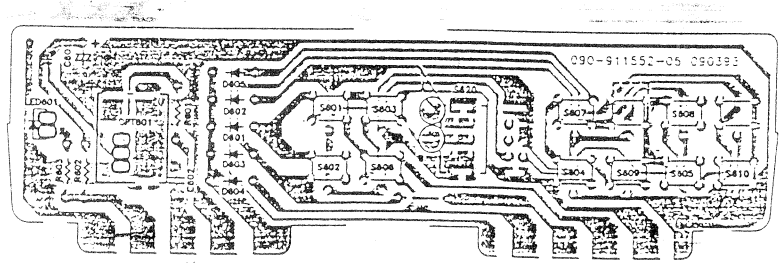


FUNCTION BOARD

(TOP VIEW)



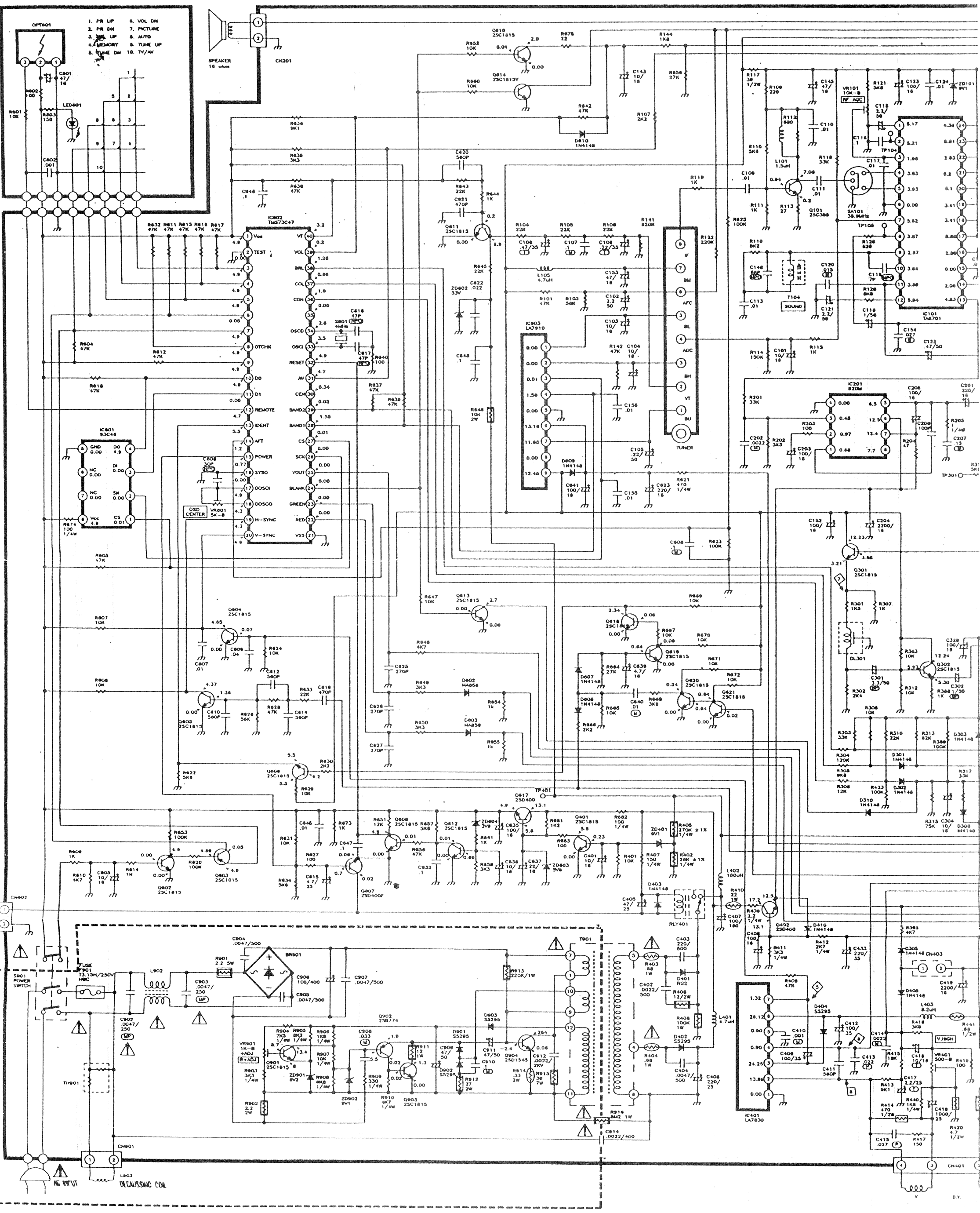
(BOTTOM VIEW)



SCHEMATIC DIAGRAM FOR PAL SECAM B/G D/K SYSTEM

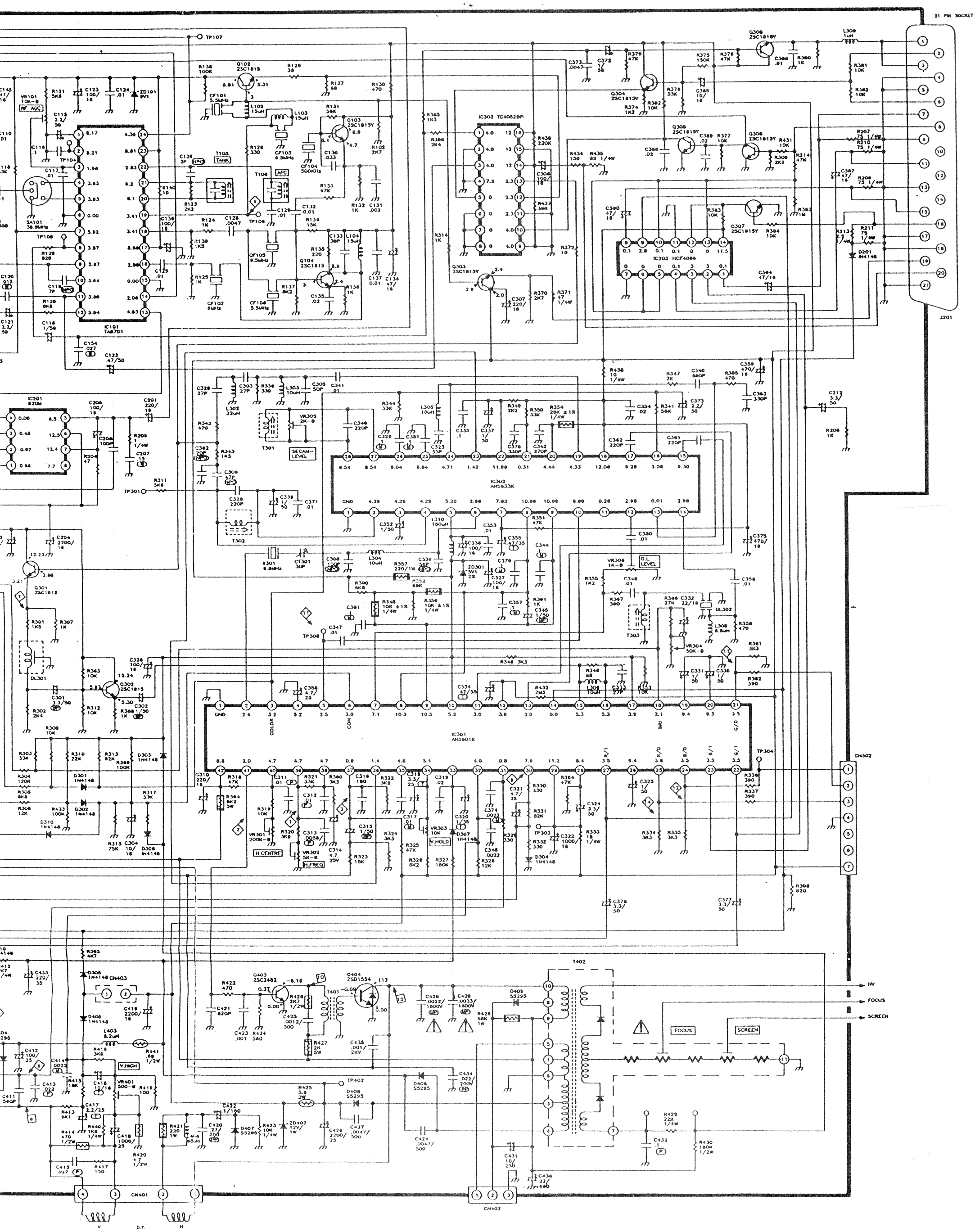
CONTROL BOARD

MAIN BOARD

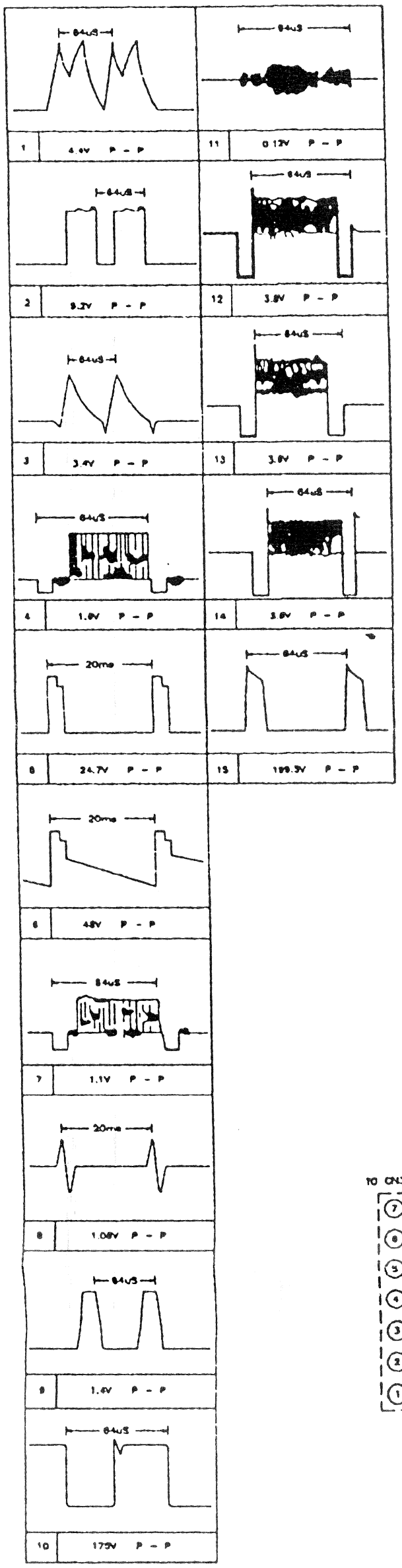


DRAWING NO. : 9515-02 (BF)

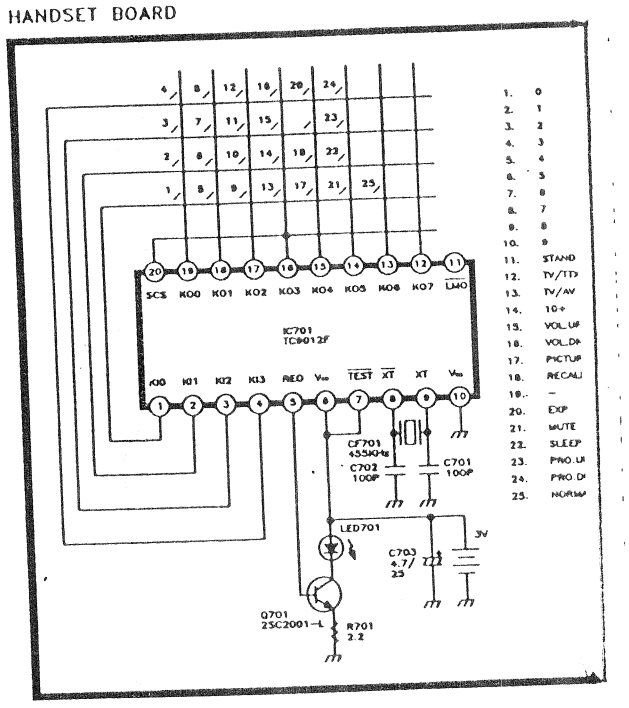
REV NO. : D (21-01-94)


21 PIN SOCKET
J201
TP107
IC101 TA8701
IC201 B20M
IC202 HCF4066
IC303 TC4052BP
IC302 AN5633K
IC301 AN5601K
Q301 2SC1815
Q302 2SC1815
Q303 2SC1815Y
Q304 2SC1815Y
Q305 2SC1815Y
Q306 2SC1815Y
Q307 2SC1815Y
Q308 2SC1815Y
Q102 2SC1815
Q103 2SC1815Y
Q104 2SC1815
Q403 2SC2482
Q404 2SD1554
D201 1N4148
D301 1N4148
D302 1N4148
D303 1N4148
D304 1N4148
D305 1N4148
D306 1N4148
D307 1N4148
D308 1N4148
D310 1N4148
Z0301 5V1 2W
ZD101 9V1
ZD402 12V/1W
T105 TANK
T106 AFC
T301 SECAM-LEVEL
T302
T303
T401
T402
DL301
DL302
X301 8.8MHz
CT301 30P
SA101 38.9MHz
CF101 5.5MHz
CF102 6MHz
CF103 6.5MHz
CF104 500KHz
CF105 6.5MHz
CF106 5.5MHz
VR101 10K-B
VR301 200K-B
VR302 5K-B
VR303 10K
VR304 50K-B
VR305 2K-B
VR306 1K-B
VR401 500-B
H.CENTRE
H.FREQ
V.HOLD
V.HIGH
D.L. LEVEL
AFC
SECAM-LEVEL
RF AGC
FOCUS
SCREEN
HV
FOCUS
SCREEN
CN302
CN401
CN402
CN403
TP301
TP303
TP304
TP306
TP402
TP105
TP106
TP108
L301 1uH
L302 22uH
L303 10uH
L304 10uH
L305 10uH
L306 10uH
L308 6.8uH
L309 1uH
L310 180uH
L403 8.2uH
DL301
DL302
R205 1 1/4W
R369 100K
R425 5.6 2W
R438 10 1/4W
R439 10 1/4W
R440 1K8 1/4W
R441 .68 1/2W
R428 56K 1W
R429 22K 1/4W
R430 180K 1/2W
R432 2M2
R434 150
R435 82 1/4W
R436 220K
R437 39K
R438 10 1/4W
R439 10 1/4W
R440 1K8 1/4W
R441 .68 1/2W
R428 56K 1W
R429 22K 1/4W
R430 180K 1/2W
R432 2M2
R434 150
R435 82 1/4W
R436 220K
R437 39K

WAVEFORM



HANDSET BOARD



CIRCUIT SYMBOLS

RESISTOR	CAPACITOR	
NONFLAMMBLE	ELECTROLYIC	PP POLYPROPYLENE
FUSEBLE	BI–POLAR ELECTROLYIC	M MYLAR
CEMENT	T TANTALUM	
METAL OXIDE	MP METALLIZED POLYESTER	
THERMISTOR	P POLYESTER FILM	

NOTE:

(1) ALL CAPACITORS ARE IN uF UNLESS OTHERWISE NOTED.
ALL CAPACITORS ARE 50WV UNLESS OTHERWISE NOTED.
(2) CAPACITOR NOT SPECIFICALLY DESIGNATED ARE CERAMIC ACPACITORS.
(3) ALL RESISTORS ARE IN OHM 1/16 WATT UNLESS OTHERWISE NOTED.
(4) RESISTOR NOT SPECIFICALLY DESIGNATED ARE CARBON FILM RESISTORS.
(5) DC VOLTAGE ARE MEASURED FROM POINT INDICATED TO THE CIRCUIT GROUND WITH A DIGITAL MULTIMETER TEST.
(6) WAVEFORMS ARE TAKEN WITH SETTING CONTROLS TO A NORMAL CONDITIONS (COLOR PHILIPS PATTERN).
(7) THIS CIRCUIT DIAGRAM IS SUBJECT TO CHANGE WITHOUT PRIOR NOTICE.
(8) ⚠ SAFETY CRITICAL DEVICE.

CRT BOARD